



## SHARP program ignites students' dreams of space

by Sherrie Super

In grade school, Douglas Neal dreamed of becoming an astronaut. Today, the teen-ager works side-by-side with engineers at the Marshall Center, where he's building the foundation for his new career goals.

A student at Lee High School in Huntsville, Neal is among 22 Huntsville-area high school seniors participating in NASA's Summer High School Apprenticeship Research Program (SHARP).

The Education Programs Department at Marshall manages the SHARP program. This year's apprenticeships continue through Friday.

Celebrating its 20<sup>th</sup> anniversary, SHARP is designed to strengthen and diversify the pool of future math, science and engineering professionals. As summer apprentices,

See *SHARP* on page 2



Photo by Terry Leibold, NASA/Marshall Space Flight Center

### ISS "backbone" ready to go

The 45-foot, port-side "P1" truss segment for the International Space Station left the Marshall Center Wednesday morning en route to Kennedy Space Center, Fla., aboard NASA's Super Guppy cargo plane. Marshall and the Boeing Co. tested The starboard-side "S1" truss, and shipped it to Kennedy last year.

## Marshall Web site lets skywatchers spot, track International Space Station

by Rick Smith

As various components start arriving at the International Space Station, stargazers and space enthusiasts can track the progress of construction on the ambitious space research facility.

And they can do it with the naked eye.

A new Web site developed at Marshall is making it easy and exciting for enthusiasts across the country and around the world to catch a glimpse of the orbiting facility.

The "Liftoff to Space Exploration" Web site at:

<http://liftoff.msfc.nasa.gov/>

lets users identify the orbiting Space Station — and determine in advance when it will pass over their hometowns. The site relies on a sophisticated, Java-based program called J-Pass, developed by Patrick Meyer, a data systems engineer at the Marshall Center.

J-Pass displays user-friendly tracking information provided by the North American Aerospace Defense Command (NORAD). It permits site visitors to track not only the International Space Station, but also the Russian station Mir, Space Shuttle missions and other objects in Earth orbit.

Orbiting at more than 200 miles above the Earth, the Space Station is quickly growing into one of the brightest permanent fixtures in the night sky. Currently consisting of the American

**"Work Hard, Work Smart, Work Safe"**  
— Safety slogan submitted by  
**Barry Hale, SD74**

See *J-Pass* on page 3

*Editor's note: The following is an e-mail received by Dennis Gallagher, a research scientist in Marshall's Science Directorate, from a Pennsylvania student he assisted with a science fair project.*

Dear Mr. Gallagher,

I can never thank you enough for all your help and encouragement you gave me last summer.

You were kind enough to answer my questions and just plain show interest in my science fair project, soda bottle magnetometer. I just wanted to let you know your encouragement was not in vain. I got FIRST place in my school! I beat out my seventh grade class and the eighth grade class, which allowed me to qualify for the regional Pennsylvania junior academy of science.

I presented my project there — SOLAR WEATHER, THE SUN-EARTH CONNECTION. I earned a FIRST AWARD there and was presented with a plaque for the HIGHEST point score in all the physical sciences. This allowed me to qualify for the state competition.

I went to Penn State to present my project along with 3,000 other kids. It was soooo cool!! I got another FIRST award!!! The really cool part of the whole experience was the reaction I got from the other kids in my school along with the teachers. They all got fired up over the project! Of course, no one knew what the project was at first, and everyone asked questions about it, even the teachers. I set up a magnetometer at school so I could do readings during the day. My teachers were really nice about me getting readings during class.

Anyway, by the time the project was coming to an end, everyone was really into it! I would find readings in my data book made after school hours or on weekends. Here, some of the teachers just "couldn't resist" seeing what the magnetosphere was doing, so they'd hit the laser pointer button and get a reading "just to see."

By January, the second floor of my school was all decorated in space related stuff: planets, NASA pictures etc. As I promised, in my oral presentation, I gave NASA, and you in particular, credit for all your "help and encouragement. NASA really does support kids in their endeavors. As one scientist said, kids are the scientists of the future and a way for NASA to insure its ongoing scientific progression." You not only helped me, but because of your encouragement, I was able to actually pull this project off, arousing the interest in space for my whole school. I can't thank you enough!!

I am actually looking forward to next years science fair!! Weird huh? No one in my class realized the resources available to kids. I guess they didn't know that REAL scientists would actually show interest in a 12 year old. Anyway, I'm thinking about doing the project again, this time comparing last year's data with data I'll get this year. You know, comparing the height of the solar cycle to the year before. Do you think it would fly?

Anyway, I just wanted you to know how well I did and that you were a big part of my success. THANK YOU THANK YOU THANK YOU!!!! Do you think NASA would ever consider offering a scholarship to SPACE CAMP as a prize for winning a science fair?? A girl can always hope?!!!

— Katie

## SHARP

*Continued from page 1*

the students earn a salary, conduct meaningful research and participate in educational activities.

"I hoped that working with engineers in the workplace would give me a feel for what I wanted to do," said Neal. His hope has paid off. Neal has set aside his astronaut aspirations and is now determined to become an electrical engineer or meteorologist.

Neal and other students in the program work eight weeks with a NASA mentor in a specific area of science or technology. "I am lucky to have my own 'personal engineer' to introduce me to engineering and give me the hands-on experience of an engineer's life," said Daniell Hawk of Hazel Green High School in Hazel Green, Ala. "I won't have to wait until I become an engineer to see what it's like."

Is the program effective? For a case study of what SHARP can do in setting the stage for success, consider the example of Marshall Center attorney Audrey Robinson. A 1982 graduate of Oakwood Academy in Huntsville, she spent the summer of 1981 as a SHARP apprentice at Marshall.

"I was 16 years old when SHARP gave me my first experience in a real-world working environment," said Robinson. "It gave me a chance to learn how to be a professional and opened doors to other opportunities."

Those "other opportunities" include completion of a bachelor's degree in chemistry, a master's degree in management and a law degree — along with real-world experience as a NASA engineer at Marshall, then as an attorney at Kennedy Space Center in Florida before returning to Marshall as an attorney.

SHARP is a competitive apprenticeship program. Since 1980, more than 2,700 high school students have participated in the program at NASA facilities nationwide, and more than 2,800 NASA employees have served as SHARP mentors. About 90 percent of SHARP apprentices go on to graduate from college.

*The writer, employed by ASRI, supports the Media Relations Department.*



Photo by Danny Reeves, NASA/Marshall Space Flight Center

Neal, working with his mentor, Marshall engineer Geoff Beech, helped create 3-D computer-aided design models for the International Space Station.



Photo by Emmett Given, NASA/Marshall Space Flight Center

## Marshall honors retirees

The annual dinner honoring last year's 238 Marshall retirees will be at 6 p.m. Aug. 17 at the Von Braun Center North Hall. The event will celebrate Marshall's 40th anniversary. Following a dinner of prime rib or honey dijon chicken, employees will perform skits. Tickets — at \$15 each — go on sale Tuesday through administration officers. All employees are invited.

## J-Pass

*Continued from page 1*

connecting module "Unity," the Russian control module "Zarya" and the Russian service module "Zvezda," the Station circles the planet approximately 16 times per day, traveling at 17,500 mph in an orbit varying 208 to 285 miles from Earth.

Because it reflects sunlight down to Earth, the Space Station often looks like a slow-moving star as it crosses the sky. That deceptive appearance can fool a casual viewer. But it also makes sighting the Station easier if one knows when and where to look for it.

The best time to catch a glimpse of the Space Station is near dawn or dusk, when the viewer is in near-darkness and the passing Station continues to reflect light from the rising or setting Sun.

The J-Pass program provides users with optimal visibility times for their locations. Detailed sky charts, including positions of visible planets and bright stars to use as reference points, can be printed for outdoor use. The program even estimates the expected brightness of the Space Station as it passes overhead.

Viewed under optimal conditions, the Station has been observed to appear nearly as bright as the star Sirius. When construction is complete, estimates suggest the 470-ton "city in space" will be brighter than the planet Venus.

Access to J-Pass requires a Java-enabled browser, such as recent versions of Netscape Navigator or Microsoft Internet Explorer. For viewers without a Java-enabled browser, the Web site includes an automated mailing list option. Subscribers to the list — more than 8,000 to date — are notified by e-mail of upcoming satellite passes.

The International Space Station is a cooperative endeavor by the United States and 15 other nations. It is the largest international space construction effort in history.

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## Countdown to Safety Bowl

Marshall's Safety Bowl begins Aug. 30 and culminates with the championship on Safety Day, Oct. 18. Teams from each directorate will compete. For more information, call Irene Taylor at 544-2051.

### Sample Questions

1. What's the proper level for the retainer clip (chest clip) on a child's car seat?
2. You should not wear headphones while driving because:
  - a) They might interfere with airbag inflation.
  - b) They might interfere with safety belt tension.
  - c) Other drivers will think you look geeky.
  - d) You might not hear the siren of a safety vehicle.
3. Why is it important to have your blood pressure checked on a regular basis?
4. If a person ingests an unknown poison, what should you do?
  - a) Call the Poison Control Hotline.
  - b) Give them warm milk.
  - c) Give them syrup of Ipecac.
  - d) Elevate their feet.
5. To prevent hot water scalds, particularly in the bathtub, at what temperature should the thermostat on your hot water heater be set?
  - a) The ideal temperature for bath water is always equal to the year of your birth minus the year of your great-grandmother's birth.
  - b) Actually, it would be better not to use a hot water heater at all. Cold showers can be very invigorating.
  - c) The hot water heater should be set no higher than 120 degrees Fahrenheit.

*See Answers on page 7*



# Professors bring space to classroom through summer research at Marshall

by Sherrie Super

On the heels of Apollo 8, when humans first orbited the Moon on Christmas Eve of 1968, fifth-grader Billy Hix stood up and told his rural Tennessee classmates he wanted to work for NASA.

The only son of a farmer, his announcement was considered too far-fetched, and he shelved his dream for three decades — until his young son introduced him to a NASA research opportunity.

Today, Hix is among 44 university professors working at Marshall through NASA's Summer Faculty Fellowship Program. The program allows educators to conduct research for the space program while enriching their teaching skills.

In a role-reversal, Hix is following in the footsteps of his son, Kevin.

A high school sophomore, Kevin has worked with NASA to develop educational programs for his local schools, campaigned to get his local cable company to carry NASA television and won a national competition for a proposed mission to Mars.

"Kevin has wanted to work for NASA since he was in the third grade," said Billy Hix, a professor of information systems at Motlow College in Tullahoma, Tenn.



Antar works with fluid flow measurements in Bldg. 4481.

"He's the reason I'm here today."

The senior Hix has spent his summer at the Marshall Center researching Web-based technologies, including ways to help NASA support classroom teachers. This is a natural progression for Hix. He's already used the space program to introduce his students — who are sometimes fellow teachers — to computers and new technology.

"If I'm trying to teach other educators how to build a Web page, I'll have them build a page proposing future missions to Mars," he said. "It makes it more interesting."

Each year, NASA awards fellowships to full-time engineering and science educators at U.S. colleges and universities. While furthering the professional knowledge of the participating professors, the fellowships also stimulate an exchange of ideas between educators and NASA employees.

Basil Antar was awarded his first NASA fellowship in 1974. An engineering professor from the University of Tennessee Space Institute in Tullahoma, he finds his NASA experience helpful in the classroom. "Working with scientists on a day-to-day basis is very important," he points out. "It helps you keep your finger on the pulse of what's going on."

This summer, Antar is conducting microgravity research that could lead to better fiber optics. Progress in this technology will have positive impact in the everyday lives of millions of Americans. "With better fiber optics, we can increase the speed of electronic transmissions," he said. "This could dramatically improve high-speed computers, digital videos and other types of communications."

Antar is a returning fellow to NASA's Summer Faculty Program. He's seen many technological advances during that time, including the wide-



Photos by Dennis Olive, NASA/Marshall Space Flight Center

**Billy Hix, seated, a faculty member working at Marshall this summer, and his son Kevin Hix, a summer intern at Marshall, try out the virtual reality**

spread use of computers and video technology — both at NASA and in the classroom.

"Computers and video systems have really changed since my first fellowship," he said, adding that these advances have opened up new opportunities for scientific research and made education accessible to more people.

In addition to their research activities, summer fellows attend weekly seminars, courses and workshops. At the end of the summer, they present reports of their research findings to their NASA colleagues.

NASA established the fellowship program in cooperation with the American Society for Engineering Education in 1966. Since its inception, nearly 8,000 faculty members have participated at NASA facilities nationwide.

*The writer, employed by ASRI, supports the Media Relations Department.*

## Marshall marks 40<sup>th</sup> anniversary

# Saturn V rocket, lunar roving vehicle take first humans to Moon

*This is the fifth in a series of historical articles the Marshall Star will publish this summer on the history of the Marshall Center.*

by Mike Wright

When President John F. Kennedy in 1961 called for the nation to put Americans on the Moon by the end of the decade, the Marshall Center was ready to answer the call.

Huntsville had already earned the title, "Rocket City." But at the time of Kennedy's challenge to the nation, no rocket in the country could take a craft to the Moon's surface. Dr. Wernher von Braun, Marshall's first director and leader of the German rocket team, answered Kennedy's challenge by immediately turning his attention to the Saturn V.

The Saturn V represented a dramatic departure from early launch vehicles that were powered by only one engine and built as a single unit. To achieve the thrust necessary for crewed lunar missions, it was essential to develop a multi-engine launch vehicle that used higher performance propellants and propulsion systems.

The towering Saturn V was the response to that challenge. The first large vehicle in the U.S. space program to be conceived and developed for a specific purpose, the Saturn V was the most powerful vehicle ever designed. More than 3 million parts, making up 700,000 components, were contained in a single Saturn V. When complete, the 363-foot Saturn V stood 60 feet taller than the Statue of Liberty and weighed 13 times more. At liftoff, the three-stage Saturn V had the power equal to the energy created by 85 Hoover Dams.

At the height of the Saturn program, as many as 20,000 contractor companies were involved in aspects of the program. From 1960 to 1964, existing test stands at

Marshall were remodeled, and a sizable new test area was developed.

While Kennedy's challenge to the nation created a sense of urgency, quality and safety were never sacrificed. Components were tested and re-tested throughout the 1960s, all leading up to the Apollo 11 lunar landing.

Finally, a short eight years after Kennedy's challenge to the nation, the work by Marshall Center employees came to fruition. The Saturn V successfully propelled the Apollo 11 crew to the Moon's surface. On July 20, 1969, mission Commander Neil Armstrong sent the message back to Earth: "Houston, Tranquility Base here. The Eagle has landed!"



**Apollo 15 astronaut Irwin works at the lunar roving vehicle with Mount Hadley in the background.**

Five successful Moon-landing missions boosted by Marshall's Saturn V followed the Apollo 11 mission. The Apollo program was completed with the flight of Apollo 17 in December 1972.

## Lunar roving vehicle

As time drew near for the lunar landings, NASA decided to provide a lunar roving vehicle that would extend the astronauts' range of exploration and their ability to carry equipment and lunar samples.

By 1969, Marshall was responsible for the design, development and testing of the

new vehicle. The vehicle contrasted with the towering Saturn vehicles. It was a fragile looking, open-space vehicle about 10 feet long with large mesh wheels, antenna appendages, tool caddies and cameras.

Powered by two 36-volt batteries, it had four one-fourth hp drive motors, one for each wheel. The peculiar vehicle was collapsible for compact storage until needed, when it could be unfolded by hand.

Marshall engineers from the Center's laboratories contributed substantially to the design and testing of the navigation and deployment systems. In fact, the backup manual deployment system developed by Marshall proved more reliable than the automated system and became the primary method of deployment.

The rover was designed to travel in forward or reverse, negotiate obstacles about a foot high, cross crevasses about 2 feet wide and climb or descend moderate slopes. Its speed was about 14 km (9 miles) per hour.

To assist in development of the navigation system, the Center created a lunar surface simulator, complete with rocks and craters, where operators could test drive the vehicle. The simulator also was used during the mission as an aid to responding to difficulties.

A lunar rover was used on each of the last three Apollo missions in 1971 and 1972 to permit the crew to travel several miles from the landing craft. Outbound, they carried a load of experiments to be set up on the Moon. On the return trip, they carried more than 200 pounds of lunar rock and soil samples.

The vehicle performed safely and reliably on each excursion and enhanced the astronauts' work efficiency. It handled as well and steered as easily on the Moon as on Earth.

*The writer is the Marshall Center historian.*

# Tech Transfer represents Marshall at Southern Growth Policies Conference

The Technology Transfer Department recently represented the Marshall Center at the Southern Growth Policies Board 28<sup>th</sup> Annual Conference in Rio Grande, Puerto Rico.

Approximately 450 policymakers and private-sector leaders were on hand to discuss the South's emerging economy and strategies for job growth and training.

Keynote speakers included Jeff Taylor, chief executive officer of Monster.com, who outlined how e-commerce is transforming today's job market; and Bernard Ebbers, president of MCI WorldCom, who discussed the need to forge more partnerships between the educational community and the private sector to ensure children receive the best education to live and work in an information technology economy.

Marshall-sponsored booths highlighted participation and successes in the Center's Small Business Innovation Research and Small Business Technology Transfer programs, technology transfer opportunities within the Minority/Women-Owned Business Initiative, and the capabilities and efforts at Marshall's Global Hydrology and Climate Center.



Courtesy photo

Technology Transfer showcases Center programs and technologies.

Formed in 1971, the Southern Growth Policies Board is composed of Puerto Rico and 14 Southern states — Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Virginia and West Virginia. Each has five members on the board: the governor and two citizens appointed by the governor, a state senator and a state representative.

## One-time ticket discount marks end of celebration

To mark the end of the yearlong von Braun Celebration of the Arts and Sciences, visitors to the U.S. Space & Rocket Center on Saturday and Sunday will receive a \$2 discount on combination tickets.

With the discount, an adult ticket will cost \$12.95 and a ticket for children, ages 3-12, will be \$8.95. A combination ticket includes the museum, all hands-on activities, one space-related IMAX movie in the Spacedome Theater and a bus tour of Marshall. A combination ticket will be increased by \$1 for visitors who want to see "Michael Jordan to the MAX" in the Spacedome.

## Obituary

**Rabatin, Michael**, 87, of Gurley, Ala., died May 16. He retired from Marshall in 1968 where he was a program analysis officer. He is survived by his wife, Grace.



Photo by Emmett Given, NASA/Marshall Space Flight Center

## Putting out the fire

Chris Robinson of Marshall's Employee and Organizational Development Department practices techniques learned during the fire extinguisher demonstration last week in front of Bldg. 4200.



## Product recall

# Compressed gas cylinder valves pose potential hazards

**C**ertain lots of cylinder valves may have had excessive torque applied to the bonnet during assembly, resulting in damaged threads.

There have been a few reported failures of these bonnets during filling of cylinders with these valves. These failures have resulted in the high-pressure expulsion of the handwheel and bonnet assemblies. These expulsions have been reported to be of sufficient force to potentially cause injury to personnel and damage to property.

The valves were manufactured by Sherwood and sold for use throughout the industrial gas industry. They are of the TV series with CGA-580 cylinder connections. This connection is used for argon, helium, nitrogen and nonflammable gas mixtures. The valves have the connection number, CGA 580, and date code stamped into the wrench flat of the valve body. The potentially impacted lots are identified by the date codes 48-99 and 03-00.

Carefully check the valves on all industrial gas cylinders containing argon, helium, nitrogen, nonflammable gas mixtures or any other cylinders equipped with valves that have CGA 580 connections. Check the valves for the following stampings in the Sherwood alert: CGA 580 48-99 or CGA 580 03-00. If you find any cylinders supplied by Air Products and Chemicals Inc. (as identified on the product label or on the neck ring of the cylinder), with valves bearing these stampings in your inventory, the following actions must be taken.

If the cylinders are not in use, quarantine the cylinders immediately and mark DO NOT USE. Contact Air Products to arrange for pickup and replacement. If the cylinder is connected to a pressurized system with or without the valve open, do not touch the cylinder or cylinder valve. Isolate the area and contact Air Products for assistance at 1-800-224-2724.

If the cylinders belong to a supplier other than Air Products, contact that company for instructions.

## Upcoming Events

**Shuttle upgrade presentations** — A Space Shuttle Propulsion Safety Upgrades Symposium will be from 8 a.m.-noon Aug. 16 in Morris Auditorium. Short presentations on the Block III main engine; Advance Health Monitoring System; Advance Thrust Vector Control System; Friction Stir Weld; and Propellant Grain Geometry Modification will be followed by question and answer sessions. Exhibits will be on display before and after the symposium. Coffee and donuts will be served at 7:15 a.m. All employees are welcome.

**AMPET Conference** — The 4<sup>th</sup> Conference on Aerospace Materials, Processes and Environmental Technology (AMPET) will be Sept. 18-20 at the Von Braun Center in Huntsville. All employees are invited. Attendees will have the opportunity to attend technical sessions, plenary sessions, poster sessions and demonstrations that will showcase evolving materials, manufacturing and environmental technologies. Pre-conference tours will depart from the Hilton Huntsville at 1 p.m. Sept. 18. Participants must pre-register for the tours; plan to dress comfortably. Tour stops include the Boeing's Delta IV Operations, Marshall's Productivity Enhancement Complex and the International Space Station Manufacturing Facility. A welcome reception will be from 6-7:30 p.m. Sept. 18 at the Huntsville Museum of Art. An exhibitor's reception will be from 5:30-6:30 p.m. Sept. 19 at the Von Braun Center North Hall. To attend, submit a Conference Form 1265 to CD20/Stephanie J. Elliot no later than Sept. 1. A blanket conference form can be submitted from each directorate or an individual form can be submitted. The blanket form must provide name, organization code, phone number and signature for each employee. Cost for the conference is \$295 through Aug. 1. After Aug. 1, the cost is \$345.

## Answers

*Continued from page 3*

1. The retainer clip should be at the level of the armpits. This clip holds the shoulder straps together, and keeps the child inside the straps in the event of a crash.

2. d) You might not hear the siren of a safety vehicle.

3. There are no discernible physical signs of high blood pressure.

4. a) Call the Poison Control Hotline at

1-800-462-0800 or 1-800-292-6678.

5. c) The hot water heater should be set no higher than 120 degrees Fahrenheit.

If you would like to join the Marshall Safety and Health Action Team, call Joel Best at 544-3788.

For more Safety Bowl questions, see "Inside Marshall," "The Daily Planet" and ETV.

## Historic video to be shown in Bldg. 4203

**S**kyLab: Mission Made Possible," will be shown at 11:30 a.m. and noon Friday in the Bldg. 4203 cafeteria.

The historic video is the second in a series being shown in conjunction with Marshall's 40th anniversary.

This presentation on Skylab describes the launch into Earth orbit, problems encountered and the problem-solving efforts at Marshall required before the crew could launch.

## Employee Ads

## Miscellaneous

- ★ Ladies' and Men's golf clubs, mixed set, \$25 each. 536-8951
- ★ Craftsman 6" jointer w/mobile stand and extra blades, \$250. 881-6909
- ★ Living room suite: sofa, loveseat, chair, overstuffed maroon velvet, \$300. 539-8976
- ★ Sears Kenmore full-size microwave oven, \$85; Murray push lawnmower, 3-1/2HP, B&S engine, \$50. 881-6040
- ★ Lawn fertilizer: Scotts Turf builder weed and feed, Vigoro Turf builder w/insect control, \$6 per 15-lb. bag. 325-6000
- ★ Console color TV, 27", \$100 obo; wood crib, \$25; child's junior bed, \$10. 721-2641
- ★ King-size mattress set, \$375. 776-9165
- ★ Murray riding mower w/dual bagger, 12HP, 38", \$375. 830-4191
- ★ "Signing Naturally" student handbook, Level 1 with videotape, never used, \$75. 858-0272/843-1929 (pager)
- ★ 1998 Champion bass boat, 150HP Mariner motor, 3 depth finders, 12/24 trolling motor, \$14,000. 776-4624
- ★ Solar panels, 3'x8', two, w/accessories, heat exchanger, pumps, tubing, etc, make offer. 837-0722
- ★ Westinghouse chest-type freezer, 15.5 cu. ft. 3 yrs. old, \$190. 461-9666
- ★ 1989 Glasstream Pro bass boat 1550, Force 70HP, Minn Kota 395, more, \$3,500. 828-8573
- ★ Fireplace insert, "Ambassador", \$275. 830-6584
- ★ 1996 Gulfstream Innsbruck travel trailer, 21', awning, microwave, larger refrigerator, towing equipment, \$7,900. 881-5093
- ★ 1993 Harley Davidson, Sportster XLH 883, 14,300 miles, many extras, \$8,000. 882-9053
- ★ Twin beds plus table convert to sitting area, green/gold, covers and cushions, \$250. 533-4824
- ★ Brother 3600D word processor w/14" CRT display, 240KB, 3.5" floppy disk, \$90. 882-8684
- ★ Protecto bedliner for late mode Chevrolet full-size pickup, \$80. 864-0465
- ★ Propane gas logs, 21", must be vented,

golden oak, \$100. 498-6349

## Vehicles

- ★ 1993 Nissan king-cab, automatic, maroon w/pearl gray camper shell, a/c, bedliner, \$5,200. 880-9025
- ★ 1993 Toyota truck, 66K miles, 5-speed, a/c, green, bedliner, \$5,995. 830-2947
- ★ 1993 Dodge Grand Caravan SE, one-owner, many new parts, service records available, \$6,000. 895-9520
- ★ 1999 Honda Accord EX, V-6, 4-door, green/tan leather, 33K miles, all power, \$20,800. 829-0608
- ★ 1992 Ford Chateau Club wagon, 95K highway miles, one-owner, \$7,500 obo. 830-5783
- ★ 1986 Toyota Camry LE, \$1,075 obo. 882-3688
- ★ 1995 Chrysler Concorde, 3.5L, V-6, 74K miles, \$7,900 obo. 881-6388 after 4 p.m.
- ★ 1999 BMW 328i, silver, 5-speed, sport package, leather, sunroof, CD, power equip., warranty, \$32,500 obo. 859-3686
- ★ 1995 Miata, red/convertible, 61,500 miles, 5-speed, PW, am/fm cassette. 830-0254
- ★ 1992 Lincoln TownCar, Executive Series, 63K miles, power seats, keyless entry, \$8,400. (256) 586-7375
- ★ 1992 Dodge Grand Caravan LE, blue, 3.3L, V-6, 104K miles, \$4,900 obo. 881-6388 after 4 p.m.
- ★ 1996 Mazda 626 LX, V-6, 63K miles, 25 mpg, white, 5-speed, \$9,200. 574-5098
- ★ 1995 Mitsubishi Eclipse, low miles, up to 35 mpg, \$7,495. 464-6944
- ★ 1991 Mercury Topaz GS, dark blue/silver, 4-door, auto, 43.5 miles, \$2,700. 837-4409
- ★ 1987 Suzuki Samurai 4-wheel drive, new tires, soft top, bikini top, 44K original miles, \$2,400. 922-1169
- ★ 1993 Plymouth Voyager, V-6, gray, 107K miles, \$4,200. 883-0103
- ★ 1989 GMC S-15 Jimmy, 4WD, 4.3L, black/blue, 210K miles, \$3,000 obo. 837-6517
- ★ 1990 Nissan Stanza, new a/c, needs transmission work, \$1,000 obo. 539-4526

## Free

- ★ Freestanding basketball pole and rim,

adjustable height; sofa and love seat, blue print. You pick up. 922-1169

- ★ Kittens, 2 tabby, 1 gray & white, and mother, abandoned by owner. 883-5975

## Found

- ★ Men's eyeglasses. Call 544-4758

## Center Announcements

✦ **'answers' for Survivors** — When a spouse or other close relative dies, the shock can be overpowering. Yet tough financial and other decisions demand immediate attention. The NASA Exchange is offering a book that can help you plan for those you leave behind. "answers" is a practical survival kit to help you organize personal and financial matters. The 80-page, fill-in workbook can be ordered through the Exchange for \$24.95. Order forms, distributed through internal mail, also are available at the NASA Exchange Space Shop in Bldg. 4752. Deadline for ordering is Aug. 11. For more information, call Candy Bailey at 544-2185.

✦ **Bahamas Vacation Cruise** — Marshall employees, retirees and contractors are being offered a Bahamas Vacation Cruise-N-Stay package for \$189 per person, based on double occupancy. The cruise sets sail from Ft. Lauderdale to the Bahamas and includes three night's hotel accommodations at the Island Palm Resort. This price includes cruise, meals on board ship to and from Bahamas, hotel accommodations, port charges and service fees. Hotel tax, departure tax and travel to Ft. Lauderdale are not included. An \$89 deposit per person plus \$10 for shipping and handling per couple must be made by Aug. 31. Travel dates are good through August 2001. For more information, call 1-800-272-4707.

✦ **CDDF Engineering Directorate Call for Proposals** — Proposals are invited by the Engineering Directorate for conducting research to be funded by the Marshall Center Director's Discretionary Fund in FY2001. More information is available on "Inside Marshall." Deadline is Aug. 11.

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